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An Entero-toxaemia in Goats

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Few records of *Cl. welchii* infections in goats appear in the literature. Recently Barron (1942), recording an investigation into an outbreak of disease in a well-managed herd of goats, described a condition resembling pulpy kidney disease in lambs and stated that he found in intestinal contents filtrates a highly potent toxin which he considered to be that of *Cl. welchii*, type C. He did not record the isolation of an organism of the *Cl. welchii* group. He obtained satisfactory control by injecting the goats with large doses (20 c.c.) of lamb dysentery serum. Crowhurst (1942) reported a similar condition in a herd of goats, 20 animals in prime condition having died during a period of six months. Reports on *post-mortem* material from several of the goats stated that "*Cl. welchii* of the lamb dysentery type" had been isolated. While lamb dysentery serum and vaccine failed to reduce the losses, somewhat better results followed the use of pulpy kidney serum.

Recently, the writers were asked to investigate, on behalf of Mr. Cornish-Bowden, the cause of deaths in a herd of goats. The owner had reported that over a period of 18 months six goats in prime condition had died. All showed scouring and symptoms of abdominal pain. Deaths occurred after periods of illness varying from nine hours to eleven days. Three or four had shown mild symptoms suggestive of the same disease but had recovered. Previous to our being consulted, *post-mortem* examinations had been carried out on several carcases and *Cl. welchii* had been suspected as the cause of death. Lamb dysentery serum and, later, vaccine had been applied but losses continued to occur.

The carcase which we examined was that of a female goat dead 21 hours after the onset of symptoms and our examination was carried out six hours after death.

Post-mortem findings.—The goat was in extremely fat condition. Macroscopic changes were confined to the small intestine, the kidneys and the heart. There was acute congestion of the first part of the duodenum, the lumen being filled with blood-stained mucoid material. Patches of congestion were present throughout the rest of the small intestine. Both kidneys were markedly swollen and moderately pulpy. The heart showed numerous small sub-endocardial haemorrhages near the apex of the right ventricle.

Bacteriological examination.—Tubes of meat broth medium were inoculated with some of the contents of the duodenum and the ileum obtained by passing a sterile pipette through the seared intestinal wall. The contents of the small intestine were then collected into a sterile jar and thoroughly mixed with an equal volume of sterile saline. This mixture was centrifuged and the supernatant, after filtration through a Seitz filter (Ford S.B. pad), tested for toxicity. 0·3 c.c. injected intravenously into mice caused death within half an hour. This suggested the presence of toxin in the filtrate and neutralisation tests with *Cl. welchii* type specific sera were carried out. For this purpose three sera were used, a type A serum (α antitoxin), a type C (α and β antitoxins) and a type D serum (α and ϵ antitoxins); (Glenny *et al.* 1933). Mixtures containing 0·3 c.c. filtrate and 0·1 c.c. serum, after standing for half an hour at room temperature, were injected intravenously into mice. The results given in Table I show that ϵ toxin was present in the intestinal contents filtrate.

TABLE I

Mixtures	Unitage* (per 0·1 c.c. serum)	Result
0·3 c.c. filtrate + 0·1 c.c. type A serum ...	60 α units	All died
0·3 c.c. filtrate + 0·1 c.c. type C serum ...	0·5 α 100 β "	"
0·3 c.c. filtrate + 0·1 c.c. type D serum ...	0·3 α 100 ϵ "	All lived 5 days

* The unitage of α antitoxin is expressed in terms of *Cl. welchii* type A (Perfringens) International Standard units. The unitages of β and ϵ antitoxins are in terms of provisional units that have been in use in these Laboratories for the past ten years.

This finding indicated that the type of *Cl. welchii* in the intestinal contents was either B or D. Both these types produce ϵ toxin, but the former also produces, among others, the lethal toxin β. As the production of the latter serves as a means of distinguishing between the two types, the original mixed cultures from the intestinal contents were examined as to the type of toxin they produced. Neutralisation tests were carried out on the filtrates of two cultures. Both overnight and two-day growths were tested. α toxin and a trace of ϵ toxin were present in the former and ϵ alone in the latter; there was no evidence of β toxin in either. Three single colony cultures subsequently isolated from these mixed cultures also produced α and toxins but no β and were identified as *Cl. welchii* type D.

Treatment of Herd.—Immediate treatment with pulpy kidney serum ("Ovitoxicus antiserum") was adopted and each adult goat was injected with 5 c.c. (1,500 units ϵ antitoxin). Two were showing symptoms of the disease at the time of injection, but 24 hours later both appeared to have recovered. No further cases have occurred during the four weeks since the injection of serum. As a possible means of producing an active immunity vaccination with a type D anaculture (formalised whole culture) at intervals of six months has been suggested.

DISCUSSION

It seems certain that a *Cl. welchii* entero-toxaemia of goats exists as a specific disease condition and that sub-acute cases may occur. In the case recorded above the causal organism was established as *Cl. welchii* type D and from the symptoms described to us it is reasonable to assume that the earlier deaths in this herd resulted from infection with this organism.

Pulpy kidney serum ("Ovitoxicus antiserum") was prescribed in preference to lamb dysentery serum for two reasons; firstly, since the type of the infecting *Cl. welchii* had been determined it was known that α and ϵ antitoxins only would be required for neutralisation of toxin produced in the intestine and, secondly, because the amount of ϵ antitoxin in a 5 c.c. dose of the pulpy kidney serum (prepared from a type D strain) was three times greater than in a corresponding dose of lamb dysentery serum (prepared from a type B strain).

Crowhurst, in a similar outbreak, found that pulpy kidney serum gave better results than did lamb dysentery serum, which failed to prevent losses. The latter serum should contain both β and ϵ antitoxins, but in the absence of an accepted standard the amount of each is not specified and does, in fact, vary considerably in different brands. It would appear that in this case there was an insufficiency of ϵ antitoxin in the dose injected.

Barron also used lamb dysentery serum in what appears to have been a *Cl. welchii* entero-toxaemia and records that no further losses occurred in the injected herd until one year later. Had this been a type D infection, as seems possible from the symptoms described, the comparatively large dose of serum injected would account for its effectiveness in this case as there was some ϵ antitoxin in the lamb dysentery serum he used.

We would emphasise here that in all outbreaks of this nature serum treatment and vaccination can only be applied to the best advantage if the type of *Cl. welchii* involved has been determined. Failure to do this means that the diagnosis is unconfirmed and may result in the use of inappropriate sera or vaccines. For the determination of type it is, of course, essential to know the antitoxin content of all sera used in the identification of toxins.

Summary

1. A condition resembling pulpy kidney disease in lambs ("strike" in sheep) was found in a goat.

2. *Cl. welchii*, type D, was established as the causal organism in this case.

3. Similar losses in the herd were probably also due to infection with *Cl. welchii*, type D.

4. Immediate control was effected by the use of pulpy kidney serum—serum rich in antibody to the chief toxin of *Cl. welchii*, type D.

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Chemical Composition of the Blood of Ankole and Zebu Cattle in Uganda

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In the wealth of literature concerning the composition of bovine blood only scant reference appears regarding that of native African breeds, with the result that the research worker in Africa is frequently hampered by lack of knowledge as to the wide variations which undoubtedly exist and the consequent difficulty of determining what can be considered the "normal" for any constituent of the blood of native cattle. This work was undertaken primarily in connection with research on trypanosomiasis, and it was soon evident that determination of the normal range for the blood chemical constituents of African breeds was a preliminary essential.

The results recorded in Table I cover analyses made during the last four years on 41 known healthy animals: 23 Ankole, 12 Zebu and 6 "mixed" or laboratory-bred bovines; whilst in Table II are recorded the values obtained in 30 "experimental" Ankole and Zebu types which, although perfectly healthy and showing no clinical abnormality, had been used, some considerable time previously, in the manufacture of rinderpest serum, and could not thus be included in the figures for absolute controls.

Technique

All the blood estimations were carried out on oxalated blood obtained from the jugular vein, in which the glucose was estimated within a few hours of preparing the filtrate (made immediately after bleeding), whilst the red cell count, leucocyte count and haemoglobin were assayed within 24 hours. Calcium, magnesium and total protein were estimated on centrifuged serum from whole blood.

Erythrocytes were counted on the blood diluted 1:200 with Hayem's fluid, at least 80 small squares of the haemocytometer being counted, whilst the *Leucocytes* were counted on blood diluted 1:20 with 0·5 per cent. acetic acid and the cells counted in an area of at least four square mm., the same Neubauer chamber being used for both counts. *Haemoglobin* was estimated with a Sahli-Hellige Normal Haemometer (100 per cent. = 14·5 gm./100 ml.) controlled by check determinations made with the Newcomer glass standard method.

The chemical analysis was carried out on "laked" blood filtrates by the colorimetric methods of Folin and Wu for *Glucose, Non-Protein Nitrogen, Amino-Nitrogen* and *Creatinine; Urea-Nitrogen* by Karr's method, *Chlorides* by Whitehorn's method; and *Uric Acid* by Benedict's method. Whole blood was used for *Inorganic Phosphorus* by Brigg's method, and *Cholesterol* by Blood-Sackett's method. *Calcium* was estimated by the original method of Kramer and Tisdall; *Magnesium* by the Denis method, and *Total Protein* by the method of Rytand (1939).

In computing the *Colour Index* (C.I.) a modification of Isaac's (1941) formula for Haemoglobin-Red-Cell Ratio was devised on the basis of the following standards (derived from Table I) as normals: Haemoglobin = 11·8 grammes per 100 ml.; Erythrocytes = 9·0 million per cu.mm. The colour index may thus be expressed as the product of the Haemoglobin (in gm./100 ml.) and the Factor 7·6, divided by the erythrocytes (in 0·1 million). This method, of course, gives identical results to the older percentage calculation but has the advantage of much simpler evaluation. For the benefit of readers who may not have access to the original abstract, the formula is:—

$$\frac{\text{Haemoglobin Standard (Gms./100 ml.)} \times \text{Factor}}{\text{Erythrocyte Standard (in 0·1 mills.)}} = 1.0 \text{ (Colour Index)}$$

the Factor being 3 for human blood, 7 for equine blood, etc.

Discussion of Results

Section "A" (Table I)

From the summary of results given in Table I it will readily be seen that the blood constituents of the 41 healthy Ankole and Zebu cattle, with the exception of erythrocyte count and haemoglobin, generally approximate the accepted range for the bovine. The references included in this table are by no means exhaustive, but have been inserted to give a ready comparison with the figures for grade stock in other countries, particularly South Africa.

The increased erythrocyte count, of approximately 9·0 million, confirms French's (1930-1938) results as well as those of Canham (1930) on cattle living at high altitudes, the latter author obtaining counts of 5·5/9·9 million on cattle living at 3,500-4,500 feet—which is also the altitude of most parts of Uganda. The leucocyte range approximates that of Canham (1930) and Fraser (1931). The colour index shows a fairly wide extreme range, but the coefficient of variation is only 12·5 per cent. The mean of 11·7 gms. for haemoglobin is slightly below the average of 13·1 gms. given by Hamersma (1937) though the extreme range is similar.

The very wide range obtained for glucose, and the high calf figures, confirm the numerous observations in the literature concerning the many factors affecting this blood constituent, but it will be seen that these extremes are only slightly outside the limits of 30-120 given by the 12 references quoted (only four values out of 62). The mean of 63·3 comes within French's (1938) figures, whilst the mode of 50-60 is within the range given by Hamersma (1937) and Dukes (1935).

All the remaining constituents approximate, in general, the results obtained by American, English and South African workers, and require no comment. Attention should, perhaps, be drawn to the slightly higher ratio of urea nitrogen to non-protein nitrogen, the mean of 42 per cent. being slightly above the figure of 37 per cent. given by Hayden (1924-25), but this is doubtless due to nutritional factors consequent on different climatic conditions.

Analysis of the figures in Table I has shown only very small differences between the Ankole and Zebu types, also between the sexes (other than a slightly higher erythrocyte count and cholesterol mean in females) and it is not considered that the inclusion of these statistics warrants publication.

Section "B" (Table II)

The results obtained from the 30 "experimental" Ankole and Zebu types included in this table show, in general, little variation from those in Table I. From the statistical evaluation appended to this table it will be seen that only in the case of glucose, chlorides, amino-N, uric acid and magnesium can the mean values obtained be considered statistically "significant." For the purpose of all the remaining constituents, therefore, these "experimental" animals may be accepted as "normals." It follows that several determinations of the "significant" constituents would be required before these types could be placed on experiments where they would be involved.

Summary

(1) The range, average and statistical data of 15 constituents of the blood of 41 healthy Ankole and Zebu cattle are recorded.

(2) The range, average and statistical data of 15 constituents of the blood of 30 "experimental" Ankole and Zebu types are also recorded. Statistically "significant" differences occurred only in the case of glucose, chlorides, amino-nitrogen, uric acid and magnesium.

(3) No appreciable differences exist between the blood of Ankole and Zebu cattle and other breeds with the exception of a higher erythrocyte count.

Acknowledgments.—I am indebted to my Chief, Dr. J. Carmichael, for permission to undertake this work, and to my colleague, Mr. S. G. Laws, for permission to include many of the blood counts and haemoglobin figures determined by him. In conclusion, I wish to record my thanks to the Director of Veterinary Services, Uganda, for permission to publish this paper.

[It has not, for reasons of space, been possible to publish the figures for each animal. The figures will, however, be made available, on request, to any worker particularly interested.]

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Table I
Blood Analyses of Healthy Ankole and Zebu Cattle in Uganda (Statistical Analysis)

TABLE I

Blood Analyses of Healthy Ankole and Zebu Cattle in Uganda (Statistical Analysis)

	Erythrocytes (Mill.)	Leucocytes	C.I.	Mg./100 ml. Blood: Hb. ×10⁻³	Glucose	NaCl	Cholesterol	N.P.N.	Urea N.	Urea N. as % of N.P.N.	Amino-N.	Uric Acid	Creatinine	In.P.	Mg./100 ml. Serum: Ca.	Mg.	Total Protein ×10⁻³
EXTREME RANGE	5·2/ 12·4	5,425/ 20,500	0·68/ 1·33	7·0/ 17·0	24·6/ 144·9	396·0/ 550·0	118·6/ 228·6	19·3/ 34·5	5·1/ 19·5	20·5%/ 71·3%	4·3/ 9·0	0·8/ 2·8	1·3/ 2·1	2·8/ 8·4	9·2/ 14·5	2·1/ 3·7	7·8/ 9·0
SUMMARY— 17 Ankole ♂♂ } 23 6 „ ♀♀ / MEAN	8·8	10,961	1·03	11·7	63·3	483·5	162·0	27·5	11·9	42·0%	6·2	1·7	1·6	5·8	11·5	2·76	8·3
8 Zebu ♂♂ } 12 4 „ ♀♀ / NUMBER OF ANALYSES	(38)	(38)	(38)	(40)	(62)	(67)	(27)	(42)	(38)	(37)	(23)	(35)	(42)	(49)	(45)	(18)	(17)
1 Mixed ♂♂ } 6 5 „ ♀♀ / STANDARD DEVIATION	±1·72	3·65 (Thousands)	0·13	2·30	27·40	22·61	28·87	3·58	4·67	15·54	1·26	0·46	0·195	1·35	1·38	0·46	0·36
STANDARD ERROR	±0·28	0·59	0·02	0·36	3·48	2·76	5·56	0·55	0·76	2·55	0·26	0·08	0·03	0·19	0·21	0·11	0·09
41 Animals COEFFICIENT OF VARIATION ..	19·5	33·3 (Units)	12·5	19·7	43·3	4·7	17·8	13·0	39·3	37·0	20·3	26·3	11·9	23·0	12·0	16·8	4·3
(26 ♂♂ ; 15 ♀♀) CLASS MODE	10·0/ 11·0	9,000/ 11,000	1·00/ 1·09			460·0/ 480·0	160·0/ 180·0	25·0/ 30·0	5·0/ 9·0	20·0/ 30·0%	5·0/ 6·0	1·2/ 1·6	1·7/ 1·8	5·0/ 6·0	11·0/ 12·0	2·4/ 3·0	8·6/ 8·8
WORKING RANGE [Mean ± 1 Standard Deviation]	7·1/ 10·5	7,300/ 14,500	0·90/ 1·16	10–13 9·4/ 14·0	50–60 35·9/ 90·7	460·9/ 506·1	133·0/ 191·0	24–31	7·2/ 16·6	27–57	5–7·4	1·3/ 2·2	1·4/ 1·8	4·5/ 7·1	10·1/ 12·9	2·3/ 3·2	8·0/ 8·6
RESULTS OF OTHER OBSERVERS				JONES (1933) : [Ankole, Zebu ; Uganda]											SEN AND ROY (1933) [India] :		
CANHAM (1930) [S. Africa] Veld Cattle	4·9/ 7·9	6,300/ 18,500		[McLean's method 35–85]					[Ambard's method : 10·8/ 35·2]								6·0/ 9·0
Grade Cattle	5·6/ 13·3	5,500/ 22,300													Average		7·2
FRENCH (1930–1938) [Tanganyika] Mixed Breeds	6·9/ 9·6			[Zebu : 6·5/ 12·2•] 11·9•	56–79	467·9/ 503·7•			15·6/ 20·1					3–7 5·0	8·6/ 13·8		5·5/ 7·2•
General Average or Range	8·10																
FRASER (1931) [England] Range	4·7/ 10·7	3,000/ 15,000		11·1/ 16·2•		ALLCROFT and GREEN (1931) [England] Range									8·6/ 11·6	1·8/ 3·1	
Quoted by DUKES (1935) [U.S.A.] Average	6·3	7,900		12·03	40·0/ 60·0	440·0/ 550·0	120·9/ 193·5	20–40	6–27		4·0/ 8·5	0·05/ 2·08	1–2	2·3/ 9·6	9–12		7·4
CRAIGE quoted by KOLMER and BOERNER (1938) [U.S.A.] ..	5·0/ 10·3	5,000/ 12,000		8·0/ 14·5	30·0/ 120·0	[MOUSSU (1926) ; WIDMARK, CARLENS (1925) ; AUGER (1926) ; HAYDEN and SCHOLL (1923–4) ; FISH (1928) ; HAYDEN and FISH (1928) ; HAYDEN (1929) ; SCHLOTTHAUER (1928) ; AMADON (1928) ; MAGUIRE (1928) ; HEWITT (1930) ; SJOLLEMA (1928)—Glucose Refs.]										
HAMERSMA (1937) [S. Africa] (Figures for "Laked" Filtrates): Figures *in brackets* by GRAF (1933) quoted by above [S. Africa]				9·9/ 17·5 (12–23)	41–98 (37–95)	412–552•		14–42 (12·5–25)	1·7/ 17·2		3·9/ 7·6 (4·3–8·4)	0·54/ 3·75•		4·5/ 10·6	7·6/ 14·3	3·5/ 7·2	

[N.B.—Figures marked • calculated from published data]

TABLE II

Blood Analysis of "Experimental" Ankole and Zebu Cattle in Uganda

	Erythrocytes (Mill.)	Leucocytes	C.I.	Mg./100 ml. Blood: Hb ×10⁻³	Glucose	NaCl	Cholesterol	N.P.N.	Urea N.	Urea N. as % of N.P.N.	Amino-N.	Uric Acid	Creatinine	In. P.	Mg./100 ml. Serum: Ca	Mg.	Total Protein ×10⁻³
SUMMARY— 14 Ankole ♂♂ } 18 4 „ ♀♀ / EXTREME RANGE	4·9/ 10·9	4,650/ 15,900	0·81/ 1·32	6·7/ 14·8	26·5/ 117·0	412·5/ 495·0	110·2/ 185·2	26·2/ 31·1	7·9/ 18·6	32·8%/ 62·1%	4·7/ 7·6	0·8/ 3·5	1·4/ 2·3	3·5/ 7·4	8·4/ 13·1	1·1/ 2·6	—
9 Zebu ♂♂ 9 / MEAN	8·1	10,672	1·02	10·7	45·2	463·0	152·6	28·5	13·2	45·6%	5·5	2·1	1·7	5·4	11·1	2·2	—
1 Mixed ♂♂ } 3 2 „ ♀♀ / (NUMBER OF ANALYSES)	(27)	(27)	(27)	(27)	(31)	(24)	(31)	(10)	(14)	(9)	(18)	(28)	(18)	(31)	(20)	(18)	(2)
30 Animals (24 ♂♂ ; 6 ♀♀) CLASS MODE	8·0/ 10·0	9,000/ 11,000	1·00/ 1·09	9–12	30–40	440·0/ 500·0	140·0/ 180·0	25·0/ 30·0	11·0/ 15·0	40·0/ 50·0%	5·0/ 6·0	1·8/ 2·6	1·5/ 1·8	5·0/ 6·0	11·0/ 12·0	2·0/ 2·6	—
STATISTICAL EVALUATION. Standard Deviation	±1·81	(Thousands) 3·05	0·14	2·09	17·90	24·91	19·26	1·84	2·87	9·54	0·69	0·60	0·22	0·98	1·25	0·34	—
Standard Error	±0·35	0·59	0·03	0·40	3·21	5·08	3·46	0·58	0·77	3·18	0·16	0·11	0·05	0·18	0·28	0·08	—
Coefficient of Variation ..	22·3	28·5	14·0	19·5	39·6	5·4	12·6	6·5	21·8	20·9	12·6	28·4	13·2	18·1	11·2	15·5	—
DIFFERENCE OF MEAN (FROM TABLE I)	—0·7	—0·29	—0·007	—0·98	—18·11	—20·48	—9·33	+0·92	+1·22	+3·64	—0·74	+0·38	+0·04	—0·43	—0·44	—0·55	(Mean Values 2 decimals)
STANDARD ERROR OF DIFFERENCE OF MEANS	0·45	0·83	0·035	0·54	4·74	5·79	6·55	0·80	1·08	4·08	0·31	0·14	0·06	0·26	0·35	0·14	—
Ratio : Difference of Means/Standard Error of Difference	1·56	0·35	0·2	1·8	3·8••	3·5••	1·4	1·15	1·15	0·9	2·4••	2·8••	0·67	1·6	1·3	4·0••	—

[NOTE : Figures marked •• considered *statistically significant*, accepting FISHER'S (1936) level of a ratio greater than 2]

THE VETERINARY RECORD

March 13th, 1943

THE COUNCIL (N.V.M.A.) AND VETERINARY EDUCATION

THE Association has always evinced a keen interest in veterinary education and members will be glad to learn that this has again been recognised by the Inter-departmental Committee on Veterinary Education in Great Britain, in that the committee has invited the Association to submit evidence for its consideration. Those chosen to present this evidence will be fortified by the discussion which took place at the first session of the Special Meeting on Veterinary Education reported in the *supplement* to this number, but there remain many important issues which need further evaluation. The first session was introduced by one of our members in a penetrating survey of the history of veterinary education in this country, coupled with a resolution that a Special Committee be appointed to report to Council. It was agreed that consideration of this resolution should be postponed until members had had an opportunity of debating the subject fully. We invite members, therefore, to ponder the issues involved and to give their views in Council or in our correspondence columns. It is indeed essential that they should do so at this time. Duly elected leaders or the representatives of an association are sometimes exposed to adverse criticism on the ground that they have acted too precipitately, or without mandate. Often this is attributable to failure on the part of members to exercise their right of acquainting those whom they have elected with what is on their minds.

What are the questions at issue in so far as the N.V.M.A. is concerned? Whilst it is for the Council to decide, we may perhaps mention some of those which seem to us to be of outstanding importance and to which we feel members of Council may profitably direct their minds before the next Special Meeting—on the 19th of this month—and upon which our ordinary members may like to express their views for the guidance of councillors.

What is the proper balance between graduate and post-graduate education or experience—or how much of the art of veterinary practice should we expect to be taught at college, and how much left to post-graduate days? On this largely depends the time available for instruction in the fundamentals of all subjects. Ought we to seek to turn out finished general practitioners and, in the same way, finished graduates for the public services and other special branches, or a graduate who has the necessary basic knowledge and mental qualities to become either?

Is our entrance standard appropriate to our needs, or should there be some system of further selection? Should there be some form of bureau at which intending students would be interviewed and advised on their probable suitability for the profession?

Should chemistry, physics and biology be taken before entry and, if this were obligatory, should the subsequent course be four years or five years? Connected with this, should the basic sciences be taught by veterinary teachers or pure science teachers in our colleges, or should they be taken side by side with students in other fields? Is it better for a veterinary student to mix mainly with other veterinary students and to have the advantage of emphasis on the veterinary aspects of the pure sciences, or should he be given the opportunity to mix freely with young people destined for widely divergent careers?

Is it best that our colleges should be private institutions with "recognised teachers," affiliated schools of universities or integral parts—faculties or schools—of universities? Which will be most likely to raise the status of the profession in the public estimation, and which will contribute most to our ability to serve agriculture and the nation? If full association with a university is desirable, what are the difficulties?

Do we desire the "one-portal" system to be preserved and, if so, can it be improved? Are we satisfied that it is, in fact, "one-portal"? Is it possible to combine the advantages of a one-portal system with those of close university association, and, if not, which is the more important?

Are the weaknesses said to exist in our present system attributable to the machinery or to its operation? Is the indirect influence of the R.C.V.S. over the teaching colleges, exercised through its statutory obligations to prescribe the curriculum and conduct examinations, reasonably effective? Could it be made more so, and are there any dangers in this?

Does the system of government of some of the colleges by appointed persons, who may or may not be qualified to govern a veterinary college, need changing? If so, is there any system by which only competent persons might be appointed as governors?

Is compulsory farm pupilage before or during the first few years desirable for all students who cannot produce evidence of the requisite practical experience; or could this experience be provided by the establishment of Farm Stations on which students would work in their earlier college years or vacations? Is it now essential that all colleges should have these Farm Stations for the teaching of animal husbandry? How much hospital accommodation for the various classes of animals should be provided? Is it desirable that colleges run general mixed practices to provide clinical material for students and teachers? If not, what are the objections?

How much is the alleged imperfection in the present training of students to be blamed upon the practitioners with whom they have seen practice? And what opportunities should be available for continuing the education of graduates themselves, whether practitioners or otherwise? Should practitioners with whom students spend vacations be appointed extra-mural teachers and be remunerated from college funds? Can a workable system of lectures and demonstrations by visiting specialists be devised? What should be the balance of attention paid to the various classes of animal, particularly during clinical instruction?

How can the need to afford the student more time for his own study and mental development be reconciled with the demand for both more technical training and more fundamental science? Can some of the detail of each be omitted?

Should the active teaching members of each college be given a sabbatical year or shorter period of study leave to visit institutions in overseas countries, and should this be a charge upon the college or the R.C.V.S.? Further, are exchanges of staff with other countries desirable in the interests of veterinary science or Britain?

These are some of the questions to which answers are needed, and many are of fundamental importance for veterinary education as a whole. Some raise serious practical difficulties. Most impinge on the duties and functions of the R.C.V.S. and teaching colleges. It must be conceded that these bodies are more directly concerned with the solutions, but in a democratic profession there is room for full consideration of vital problems by all and much good may result from such discussion. At this stage, however, it may be accounted well if we do not pay undue regard to apparently irreconcilable difficulties, but keep our ideals steadily before us, until we have ascertained how much there is of common ground for agreement and, as we believe possible, reached decisions on main principles.

CLINICAL COMMUNICATION

Intra-peritoneal Medication with Sulphanilamide

T. Y. Ranson, M.R.C.V.S.,
Dungannon, N. Ireland

Cases of metritis in cows holding the after-birth are met in practice, which do not respond to the usual methods of treatment, and death supervenes while the uterus is in a septic condition, or more rarely when the sepsis has cleared up. It is probable that peritonitis is the cause of death in a large number of these cases, and may also be present in cases which recover after several days' treatment or become piners. The oral administration of sulphanilamide has not given good results in these cases.

In *The Veterinary Record* of May 31st, 1941, it is suggested that the administration of sulphanilamide intraperitoneally may prove useful. The first cow selected for treatment was in a dangerous condition—unlikely to recover—and it was not difficult to persuade the owner to allow the treatment to be carried out.

Method of Administration.—The hair is clipped on the right side of the abdomen over an area corresponding to the site of puncture of the rumen on the left side. Tincture of iodine is applied and 5 c.c. of 5 per cent. procaine solution is injected subcutaneously and intramuscularly. An incision ½ inch long is made in the skin and a trocar and canula as used for puncturing the rumen is inserted into the peritoneum. 2 oz. sulphanilamide in 1 pint of sterile water is injected with the neo-injector, inserting the rubber tube into the lumen of the canula. It may be suggested that it is dangerous to insert the trocar and canula into the peritoneum, but the cases in which this treatment is indicated are not feeding, the abdomen is empty and the organs are not so likely to be punctured as when the abdomen is normally distended.

Case 1.—*Subject.*—Blue cross-bred cow calving at full term.

1st day. The cow was delivered of a very putrid calf and the uterus was douched with tepid water. The cleansing was adherent and the cotyledons were gangrenous, those in the non-pregnant horn separating. The cow had been off her feed for a couple of days.

2nd day. The uterus was douched, a pessary inserted and stimulating powders given.

3rd day. The condition of the cow was much worse; the appetite was in abeyance, she was groaning continually, and could not be persuaded to get up. 2 oz. sulphanilamide was administered intraperitoneally and the uterus douched with tepid water.

4th day. The improvement was remarkable. On entering the shed the cow arose of her own accord and appeared normal. The owner stated that she had commenced to feed that day.

6th day. The cleansing and cotyledons were expelled without any further treatment.

Case 2.—*Subject.*—Roan cross-bred cow, seven months pregnant.

1st day. Hydrops amnii was diagnosed and 2½ c.c. stilboestrol dipropionate was injected.

3rd day. The cow had symptoms of impending parturition and 2½ c.c. stilboestrol was injected.

6th day. When seen the cow had commenced to calve, had passed a large quantity of fluid, and the calf was delivered. The distension of the abdomen had prevented the cow from feeding and she commenced to eat hay.

8th day. The owner reported that the cow had ceased feeding the evening before and had been very ill all night. She was very dull and showing symptoms of metritis. 2 oz. sulphanilamide was administered intraperitoneally and the uterus douched. The uterus was very putrid and only a few shreds of the cleansing remained.

9th day. The cow had returned to normal and commenced to feed. The uterus was douched and recovery was uneventful.

Case 3.—*Subject.*—White cross-bred cow, seven months pregnant.

1st day. The cow was calving, the head and legs being out, but the calf could not be delivered till its abdomen was punctured allowing a large quantity of fluid to escape. The owner stated that the cow had been very big in the body and had expelled much fluid when she commenced to calve.

2nd day. Metritis developed and the cow was dull and off her feed. 2 oz. sulphanilamide was administered intraperitoneally and the uterus douched. Part of the cleansing, which broke off in handfuls, was removed.

3rd day. There was a decided improvement in the appearance of the cow. The uterus was douched and a large quantity of putrid fluid syphoned out.

5th day. The cow appeared normal except for slight discomfort due to accumulation of putrid fluid in the uterus which was syphoned out.

Remarks

Metritis developing in cows that have had hydrops amnii is difficult to treat and has proved fatal in the majority of cases. The abnormal length of the uterus makes it difficult to remove the cleansing and douching is not satisfactory as not all the fluid may be syphoned out. Sulphanilamide intraperitoneally may prove useful in these and other cases of metritis not responding to the usual methods of treatment.

ABSTRACTS

[**TREATMENT OF CANINE LEPTOSPIROSIS.** Means, T. I. (1942.) *N. Amer. Vet.* **23**. 665-666.]

A practitioner from Santa Fe, New Mexico, records a method of treatment which he claims to have been successful in over 40 of 50 cases of "leptospirosis" diagnosed during the summer and autumn of 1941. It is stated that many of the diagnoses were confirmed serologically, but details of five of these only are given, *viz.*, four which were positive for *L. icterohaemorrhagica* and one which was positive for *L. canicola*. Treatment consisted in the intramuscular injection of nicotinic acid, together with the administration of vitamin B_1, a liver extract, and artificial Carlsbad salts.

A. N. W.

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[**DISEASES OF THE RABBIT.** Gordon, R. F. (1942.) *Vet. J.* **98**. 8 and 9, 152-163.]

This article is a reprint of a paper given to County Poultry Instructors at a refresher course. The subject is one of considerable importance in view of the great extension of rabbit keeping in wartime. Under the heading of "Bacterial Infections," the following diseases are described: tuberculosis, pseudo-tuberculosis, snuffles, necrobacillosis, strangles, haemorrhagic septicaemia, salmonella infections and rabbit syphilis. In the protozoan group a full description of coccidiosis and the necessary hygienic measures to deal with the disease are given. The fungus affections, favus and ringworm, are also dealt with, as well as the common external and internal parasites.

The article includes a description of a disease causing heavy losses in young rabbits. The mortality may be extremely high and spread rapidly through a rabbitry. There are few premonitory symptoms and obvious lesions are absent on *post-mortem* examination. The cause is unknown.

D. L. H.

Weekly Wisdom

A modern world which can combine to control the production of tea and rubber, tin and copper in the interests of an investing public, might well find the means of exhibiting a greater solidarity in dealing with issues vital to the welfare of the colonial peoples.—*Nature.* (1941.) **148**. 588.

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Royal Institution Lectures.—Sir Henry Dale is to give a series of Tuesday afternoon lectures, beginning at 3 p.m., on March 16th, 23rd, 30th, and April 6th, on "Chemistry in Modern Medicinal Treatment." The sub-titles of the lectures are: (i) Pre-scientific Discoveries, (ii) Imitating Nature, (iii) The Beginning of Chemotherapy, (iv) Present-day Developments.

IN PARLIAMENT

Control of Artificial Insemination

In the House of Commons on March 2nd, the Agriculture (Miscellaneous Provisions) Bill was read the third time and passed. On Clause 16 (Control of Artificial Insemination) Mr. Hudson (Minister of Agriculture) said: I beg to move, in page 11, line 10, at end, to insert:—

"and any semen so detained shall be detained at the owner's risk in such place and manner as the Minister may direct and, if such proceedings as aforesaid result in a conviction, shall be destroyed or otherwise disposed of as the Minister may direct."

Sub-section (6) of this Clause as drafted (proceeded the Minister) provides merely for the detention of semen pending the result of any proceedings instituted and this Amendment is designed to provide for dealing with the matter after we have obtained a conviction.

The amendment was agreed to.

QUESTIONS

Milk Pasteurisation

Dr. Russell Thomas asked the Parliamentary Secretary to the Ministry of Food whether he is taking any steps to advertise the pasteurisation of milk?

The Parliamentary Secretary to the Ministry of Food (Mr. Mabane): No, Sir.

Viscountess Astor: Why not?

Mr. Rickards asked the Parliamentary Secretary to the Ministry of Food, in view of the increase in the death rate in London of 67 per cent., alleged to be due to non-pulmonary tuberculosis in 1941, as compared to 1938, whether he will refuse to make pasteurisation compulsory in London, as this death rate is higher than the average rate in the country, where the proportion of raw milk drunk is higher?

Mr. Mabane: My hon. Friend's Question appears to rest on the assumption that non-pulmonary tuberculosis is due wholly or mainly to tuberculous infection of the bovine type and that its incidence is therefore an index of the amount of bovine infection. There is no evidence for this assumption. It was estimated before the war that only 30 per cent. of the cases of non-pulmonary tuberculosis at all ages were due to bovine infection, and it is to be expected that since the outbreak of war the incidence of non-pulmonary tuberculosis should have increased more in towns where the risks of human infection are greater, and are accentuated by war conditions, than in the country. The statements referred to by my hon. Friend do not bear directly on the question of pasteurisation.

Mr. Rickards: If in London, where 90 per cent. of the people are using pasteurised milk far more than in the rest of the country, tuberculosis has increased far more rapidly, does it not show that pasteurisation is not only useless, but does damage?

Mr. Mabane: My hon. Friend will recognise that the relevant figures are the figures of bovine tuberculosis.

Mr. Thorne: As so much dried milk is being used, will the Parliamentary Secretary consider the advisability of seeing that no coupons are surrendered?

Mr. Mabane: No coupons are needed for dried milk.

Mr. Thorne: Yes, they are.

Mr. Mabane: No, they are not.

Milk (Purity)

Dr. Russell Thomas asked the Parliamentary Secretary to the Ministry of Food what steps his Department separately, or in conjunction with the Ministry of Agriculture and the Ministry of Health, has taken to ensure a clean, fresh and sound milk supply for domestic consumption?

Mr. Mabane: My Noble Friend, in consultation with my right hon. Friends the Minister of Health, the Secretary of State for Scotland and the Minister of Agriculture and Fisheries, is giving detailed consideration to the steps which could be taken at the present time to provide the public with the maximum quantity of safe milk. He is also consulting representatives of producing and distributing interests. I am not, however, in a position at present to make any statement on the subject, but I hope it may be possible to make an announcement of the Government's intentions at an early date.

Dr. Morgan: Would the Minister consider the possibility of issuing a White Paper on this subject?

Mr. Mabane: Let us have the announcement first.

Hill Cattle Subsidy (Scotland)

Mr. Snadden asked the Secretary of State for Scotland whether he is now in a position to state that the disparity existing between the hill cattle subsidy schemes of Scotland and England has been removed?

The Secretary of State for Scotland (Mr. T. Johnston): Proposals are under consideration for bringing the Scottish scheme in some respects more closely into line with that proposed for England, and I hope to be able on an early date to announce what the modifications will be. I would, however, repeat what I said in reply to my hon. Friend's Question on February 2nd, that it is by no means clear that the differences between the two schemes are on balance disadvantageous to the Scottish farmer.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Mar. 17th.—Meeting of the Society of Veterinary Practitioners at Aberdeen, 2.15 p.m.

Mar. 18th.—Meeting of the Society of Veterinary Practitioners at Glasgow, 2.15 p.m.

Mar. 19th.—Meeting of Council, N.V.M.A. (Adjourned Special Meeting on Veterinary Education), Connaught Rooms, Great Queen Street, Kingsway, W.C.2, 1.30 p.m.

Mar. 24th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at the Society's House, 1, Wimpole Street, W.1, 2.15 for 2.30 p.m.

Mar. 24th.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington, 2 p.m.

Mar. 24th.—Meeting of the Scottish Branch, N.V.M.A., at Glasgow, 2.30 p.m.

Mar. 26th.—Meeting of the North Wales Division, N.V.M.A., at Rhyl, 2 p.m.

Mar. 27th.—Meeting of the Society of Women Veterinary Surgeons, Friends' House, Euston Road, N.W., 2.30 p.m.

April 14th—15th.—R.C.V.S. Committee and Council Meetings, Royal Station Hotel, York.

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Adjourned N.V.M.A. Council Special Meeting on Veterinary Education

As announced above, it has now been arranged to hold the Adjourned Special Meeting of Council for the continued consideration of the subject of veterinary education at the Connaught Rooms, where it is hoped that there will be a full assembly of members on Friday next. In this connection attention may be drawn not only to the report of the proceedings at the first special sitting appearing in this week's *supplement*, but to the editorial article in this issue in which the opportunity is taken to set forth the outstanding quesions at issue as revealed in the former debate.

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TOWELS FOR VETERINARY SURGEONS

Arrangements have now been completed to enable veterinary surgeons to get a limited number of towels for professional use without surrendering their personal clothing coupons. Supplies of towels are, however, still extremely short and veterinary surgeons who do not need new towels yet are specially asked to postpone their applications as long as possible.

The coupons which will be allowed will vary between four and twelve according to the particular needs of each case. In general, an allowance of four coupons only (enough for two large towels) will be made in the first instance and where no case for special consideration is stated.

Applications should be made to the appropriate one of the following addresses: Ministry of Agriculture and Fisheries (Animal Health Division), St. Annes-on-Sea, Lancashire, *or* Department of Agriculture for Scotland, St. Andrew's House. Edinburgh 1, *or* The Priority Officer, Ministry of Agriculture, Stormont, Belfast.

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PERSONAL

Appointments.—The following first appointments in the Colonial Veterinary Service are announced: Mr. R. A. Hutchinson, M.R.C.V.S., Veterinary Officer Gambia; Mr. A. R. J. McGregor, B.V.Sc., M.R.C.V.S., Veterinary Officer Northern Rhodesia; Mr. E. J. Westcott, M.R.C.V.S., Veterinary Officer, Nigeria. Mr. Roderick Macgregor, F.R.C.V.S., formerly G.V.S., Pahang West, Raub. Federated Malay States, is now in the service of the Palestine Government holding the post of Dairy and Animal Husbandry Officer in the Veterinary Branch of the Department of Agriculture and Fisheries.

Marriages.—Straiton—Harrison.—Between Edward Cornock Straiton, M.R.C.V.S., son of Mr. and Mrs. G. R. Straiton, of Dalmuir, Dumbartonshire, and Marie Loraine, only daughter of Mr. S. Harrison, L.R.I.B.A., and Mrs. Harrison, of Shoal Hill, Cannock, Staffs.

THOMAS—PHILLIPS.—The wedding took place at Swansea on February 23rd between T. Idwal Thomas, M.R.C.V.S., Tyrhos, Treorchy, Glam., and Elizabeth Ray Phillips, only daughter of Mr. and Mrs. E. M. Phillips, Rose Villa, New Quay, Cardigan.

Will.—Mr. Hugh Tudor Hughes, F.R.C.V.S., of Oswestry, left £18,501 (net personalty £13,197).

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R.C.V.S. OBITUARY

LEACH, Harold Hugh, Derby House, Newmarket. Graduated London, July 9th, 1918. Died March 3rd, 1943; aged 53 years.

MR. HAROLD LEACH, M.R.C.V.S.

We record above with much regret the death of Mr. Harold Leach, of Newmarket, who succumbed to pneumonia after he had caught a chill while attending the Newmarket December Sales.

Mr. Leach was the second son of the late Mr. Edward Hugh Leach, F.R.C.V.S.—also a veterinarian of wide repute—being associated with his father for some years and succeeding to the practice upon his father's death. Professionally, he was held in high esteem, and was veterinary surgeon for a number of the principal racing stables in Newmarket. In a tribute, the *Bury* (St. Edmunds) *Free Press* says: "Mr. Harold Leach took no part in public life, but had a very large circle of friends, and was a popular member of the New Subscription Rooms Club. His elder brother, Captain Robert E. Leach, M.R.C.V.S., met his death during the war of 1914-18. He was a nephew of Mr. Felix Leach, of Graham Place, who has trained in Newmarket for many years and is also a prominent breeder of bloodstock."

Mr. Harold Leach leaves a widow and two children, a son and daughter, with whom much sympathy is felt. The son is serving with H.M. Forces in the Middle East.

MAJOR JAMES HEARD, E.D., M.R.C.V.S., D.T.V.M.

An Appreciation

We have received from Mr. W. W. Henderson, D.V.S., Veterinary Department, N. Nigeria, the following tribute to the late Major James Heard, whose death was recorded in our issue of January 16th:—

The sudden death of Major J. Heard, E.D., M.R.C.V.S., D.T.V.M., on November 7th, 1942, while on active service with the Nigeria Regiment in this country came as a sad shock to his colleagues and to his many friends in Nigeria.

During the pre-war period in which he served as a member of the Supplementary Reserve of the Nigeria Regiment, his keenness, energy and military ability earned for him the Efficiency Decoration, and upon being called up shortly after the outbreak of war he quickly rose to the rank of Major. It was while on military exercises that his untimely death occurred at the age of 39.

Jimmy Heard, as he was affectionately known to his many intimate friends, had not only gained wide social popularity in this country, but his uprightness, dependability and keen sense of justice earned the ready admiration and respect of all who came in contact with him whether at work or at play. He was a fine type of man indeed, in whom rare human qualities were generously combined with high professional ability. As a veterinary officer his expert knowledge and practical common sense raised him to high standing in the Colonial Veterinary Service, in which his valuable attributes will be hard to replace.

The deepest sympathy is extended to his devoted wife, who shared his life in this country throughout most of the 13 years of his service in the Nigerian Veterinary Department.

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STUDENT VICTIM OF ACCIDENT IN SCOTTISH ZOO

Much sadness has been caused to the staff and students of the Royal (Dick) Veterinary College, Edinburgh, by a tragic accident on Tuesday of last week, when Graham Wishart, aged 23 years, a student at the College was fatally shot at the Scottish Zoological Park, Corstorphine, while preparations were in progress for the destruction of a female elephant.

Graham Wishart was with a party of students from the College, some of whom, including himself, had climbed on to a roof to get a view through a glass window of the shooting of the elephant.

It is understood that the gun was held with its muzzle pointing upwards when it accidentally went off with such a tragic result. The bullet passed through the roof of the building and struck Wishart, who was taken to the Edinburgh Royal Infirmary, where he was found to be dead.

The dead student, who is the twin son of the late Gordon T. S. and Mrs. Wishart, 22, St. Fillans Terrace, Edinburgh, resided with his mother, with whom profound sympathy is felt.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion of having received the approval of the N.V.M.A.

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SOME CONDITIONS ASSOCIATED WITH BRUCELLA INFECTION AND A SUGGESTED LINE OF TREATMENT

Sir,—The condition to which I would refer principally is a bursitis affecting pre-eminently the stifle region in cattle. In this area, at least, it is quite a common condition found in adult cows generally over three or four years of age: I do not recall having seen it in a bull. The first symptom noticed is a lameness that can usually readily be referred to the stifle region, where enlargement of the area below the patella and also on the outside of the limb at that level can be found and where pain is exhibited on pressure. Occasionally both limbs are affected. If the lameness is of sufficient degree, wasting of the muscles of the croup and rump soon becomes marked and in many cases wastage of bodily condition leads to early and uneconomic disposal. Spontaneous recoveries occur in the milder cases, though often qualified, the bursae remaining more distended than normal, particularly that on the outside of the limb. Treatment, in my hands at least, has previously often seemed unsatisfactory. Another condition that frequently co-exists with the above in the same herd is hygroma of the knee: the two may and often do co-exist in the same animal.

For some time past, dissatisfied with results previously obtained in many cases, it has been my practice to submit selected cases of these conditions to treatment by the intravenous injection of an aqueous solution of Na iodide and so far with gratifying results. The majority have had two injections with an interval of a week between the two. One cow I can recall relapsed after two injections, but was reported satisfactory after a further two.

From the results obtained it was decided to attempt this line of treatment in the horse, when opportunity offered a suitable case of poll evil or fistulous withers. Since that time, only one has come along, a 5-year-old heavy draught gelding that had suddenly developed a painful enlargement at the poll. A blood sample was taken and the injection given at one and the same time: that sample got lost in the post and a second sample was not taken nor injection given till a fortnight later, and then it was difficult to find any trouble at the poll. That fact of itself is not a sufficiently convincing proof of the value of the use of the treatment for this condition, but it certainly did the horse no harm. The pathologist's report established the existence of Brucella infection.

So far no ill effects have been noted from this line of treatment, but the possible untoward effects on pregnant animals have been and should be kept in mind. It has been used on a sufficient number of cases to allow me to speak with some assurance of its value in these particular cases in cattle.

Yours faithfully,

Axminster. E. G. CONISBEE.

February 17th, 1943.

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RUPTURE OF BLADDER IN THE OX

Sir,—On September 4th, 1942, a grade Holstein bull, "King Ormsby Ideal Beauty," was brought to the attention of the Veterinary Division, having served a cow some two hours previously and having passed a little blood through the sheath. The animal was otherwise fit, eating normally. The sheath was syringed out with a little bicarbonate of soda in warm water and finally with 1:1,000 acriflavine solution, this being repeated twice the following day. The bull did not pass any further blood and was micturating freely. He was, however, rested from service. He was again brought to the Veterinary Division 18 days later, having refused his food that day, and gone down twice on the short walk from his paddock to the laboratory.

When examined the eye was extremely sunken; the temperature 102°. The bull was a little distended abdominally, but not unduly so. He appeared by his stance to be anxious to micturate, but unable to do so. Respiration was rapid. On rectal examination the animal showed signs of great pain. The bladder felt comparatively small. On withdrawing the hand bloodstained dung was adherent to the arm.

The bull was "blowing" quite heavily now, and died within a few minutes.

On opening the abdominal cavity a huge quantity of urine estimated at several gallons was found. The bladder was ruptured by a hole 10 in. long. The stomach was full of food, but there was very little in the intestines. The bladder and penis were dissected out and the whole urethral tract from the bladder to the glans penis was opened.

The neck of the bladder was tightly constricted and heavily congested and ulcerated. The urethra proper appeared normal except for a little blood in the passage.

Microscopic slides were taken from the ulcers in the bladder, but no specific organism was seen.

I should be grateful for any suggestions indicating the reason for such a condition or to hear the experience of any other practitioner with a similar case.

Yours faithfully,
T. Threlkeld, B.Sc., M.R.C.V.S.,
V.O., Jamaica.

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CEREBROSPINAL EUTHANASIA IN THE DOG

Sir,—Referring to the abstract in the issue of February 6th, I used this method a few years ago, before nembutal, but have largely given it up as it is not quite such "plain sailing" as it might seem. It certainly gives instantaneous death and if the injection is well done there is no evidence of pain. Some dogs show no sign of being aware that the needle is being inserted. Highly strung dogs may show distinct evidence of pain from the needle. I always found that 5 c.c. of chloroform was plenty for the dog of average size, but big dogs certainly require more. The latter seem to take slightly longer to collapse but death is very quick. The optimum result is that the dog's legs just "give way" under it and there is no other movement: ordinarily, there may be slight movement afterwards but not much.

The nose of the dog should be depressed so that the occipito-atlantal space is well open and then the needle will penetrate quite easily. Cessation of resistance to insertion of the needle and flow of cerebro-spinal fluid indicates the correct position for injection. If the insertion of the needle is not carefully done and the spinal cord is pierced there will be decided pain. Similarly, lateral deviation of the needle gives pain. The usual fault seems to be pointing the line of insertion too far forward and striking the occipital bone.

The chief disadvantage is that the dog needs to be kept perfectly still while the needle is inserted and it is very difficult to get nervous dogs in the right position and to keep them still for the time taken to insert the needle, especially when one is "single handed." The needle used must be fairly fine for the length required and it is not difficult to break it, particularly when the syringe is fitted on to the needle. Except in quiet dogs, the method requires one or more persons to steady the patient so that the best result may be obtained.

Yours faithfully,
A. J. Baxter.

Lechlade,
Glos.
February 21st, 1943.

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WAR ANIMALS ALLIES FUND (FOR RUSSIAN WAR HORSES)

Sir,—This Society has now ready for issue to any of your readers copies of our First Report of the War Animals Allies Fund (for Russian War Horses), which briefly describes our efforts and achievements on behalf of the Soviet Veterinary Corps. Our success in this connection has been largely due to the active co-operation, and the ready financial support, of members of the veterinary profession, not the least among them being Mr. H. C. Swann, of the Veterinary Hospital, London Road, King's Lynn, Norfolk, to whom we wish to extend our sincere gratitude for all his help. I am enclosing, for your own information, a copy of the First Report referred to, and I shall be pleased to send one of these to any reader upon application to the above address. We have raised more than £32,000 for Russian War Horses, and, in the First Report, details are given of the veterinary requisites despatched to date to the Soviets.

With thanks again to all those veterinary surgeons in this country who have for so long assisted this Society in so many and varied ways.

Yours faithfully,
S. G. Polhill,
Acting Chief Secretary.

Royal Society for the Prevention of Cruelty to Animals,
105, Jermyn Street,
London, S.W.1.
February 25th, 1943.

STERILITY: UNHELPFUL CRITICISM

Sir,—We have noticed with regret that there seems to be a growing tendency for letters or articles published in *The Veterinary Record* to be criticised to such an extent that the subject under discussion finally resolves itself into a personal criticism of all concerned, the original point at issue being completely ignored. This is particularly so when the subject of sterility is the one in question. We believe that, in spite of the length of time this subject has been under investigation, there are few facts about which there can be no argument whatever. Further, we believe that the more experience a man has in this work, the more he must realise that he cannot be dogmatic in his statements.

During the last few years there has been a considerable addition to the literature on sterility, especially in *The Veterinary Record*—some of which we have had great difficulty in confirming to our satisfaction—some, indeed, we frankly admit we cannot confirm at all. We realise, however, that a large amount of continuous practice is necessary to become expert at the work. A statement may appear wholly unreasonable at the time of reading it, but at a later date it may be proved to be quite correct. We quote an example: There is some difficulty in noticing the power of the uterus to contract on palpation per rectum. We would like to record that we have experienced this phenomenon in several cases, and we have no doubt that the people who cannot detect it at present will be able to do so, provided they continue to examine a sufficient number of normal uteri.

We could quote many more examples, but the point we wish to make is this: it must surely be of greater benefit to science if, instead of adopting the attitude that many years' experience presupposes infallibility—resulting in dogmatic condemnation—helpful and constructive criticism should be offered. After all, it is not an unheard of occurrence for a mere learner to record a happening of which an expert is ignorant.

In conclusion, we should like to say that we sincerely hope any colleague who wishes to record his theories or his findings will not in any way be deterred by the thought of the destructive criticism which may follow his efforts.

We are, yours faithfully,
Jean M. Makinson,
G. S. Powley,
J. B. Makinson.

Headingley,
Leeds 6.
February 19th, 1943.

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SAFE MILK CONTROVERSY

Sir,—As the wife of a veterinary surgeon, it is with amazement that I notice the lack of participation, by members of the profession, in the milk controversy now raging.

Is the profession as a whole content to sit back and allow the medical profession alone to decide what shall be done to improve the purity of our milk supply?

Veterinary surgeons will apparently enter the lists only when called upon to function at the behest of another body. Whatever the merits or demerits of pasteurisation may be, it is obvious that something will have to be done, if only to still the present outcry. At the present time it is doubtful whether the Government can, or will, authorise the manufacture of sufficient plant to bring a total pasteurisation scheme into existence.

Therefore, would it not be wise that some views should be expressed now by the N.V.M.A. and practitioners generally? Personally I have only once seen any comment in the Press from the veterinary point of view and that a quotation from a statement made by the late Sir Frederick Hobday, which formed part of a letter to the editor of a well-known daily. Almost all veterinary surgeons are overworked to-day, but surely there are some with the time and inclination to make contributions to a subject which most nearly concerns them and which, by their training, makes them the most suitable body to tackle it.

Probably the profession as a whole realises that to bring about the Utopian state of a pure milk supply about 60 per cent. of the milk cows of this country would need to be eliminated.

Nevertheless, it appears to me that some scheme will be evolved in which we shall find the veterinary surgeon playing the "small boy" part, unless they evince a display of interest now in a matter which publicly and privately should be entirely their department.

Faithfully yours,
Olga V. Simons.

Lindow Lodge,
Lancaster.
March 2nd, 1943.

Erratum.—"Fertility and Infertility in the Bovine," R. H. Smythe, *Vet. Rec.* **55**. 125, col. 2. In line 10 of Mr. Smythe's letter *for* Gould *read* Gold. We apologise to all parties concerned for this unfortunate printer's error.